IN THE SPECIFICATION:

Please amend the specification as follows: Page 13, Lines 15-19:

An anisotropic conductive film according to the present invention is characterized in that it contains a metal powder having the form of a lot of fine metal particles being linked in a chain shape and in which the ratio L/D of the length L to the diameter D of the chain is not less than 3, is contained as a conductive component.

Please amend the specification as follows: Page 14, Lines 18-23:

Moreover, in the chain-shaped metal powder, ~~the ratio of the thickness to the length of the chain is~~ the ratio of the diameter D to the length L of the chain is not less than 3, as described above, and is preferably as high as approximately 10 to 100. Even if the metal powder is added in a small amount, a network having good conductive properties can be formed in the anisotropic conductive film.

Please amend the specification as follows: Page 16, Lines 11-20:

It is preferable that the chain-shaped metal powder or each of the metal particles forming the metal powder is formed of

· a metal having ~~paramagnetism~~ ferromagnetism,

· an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism,

· an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal, or

· a complex containing a metal having ~~paramagnetism~~ ferromagnetism.

Please amend the specification as follows: Page 18, Lines 8-18:

It is preferable that the whole of the metal powder formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, or an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal out of the foregoing metal powders or each of the metal particles, or

a portion, of the metal powder formed of a complex containing the metal having ~~paramagnetism~~ ferromagnetism or each of the metal particles, containing the metal having ~~paramagnetism~~ ferromagnetism,

is formed by being deposited in a solution containing a reducing agent by adding ions forming the metal having ~~paramagnetism~~ ferromagnetism which is its forming material to the solution.

Please amend the specification as follows: Page 22, Line 19 to Page 23, Line 19:

Furthermore, ~~it is preferable that~~ in the above-mentioned metal powder, the ratio L/D of the length L to the diameter D of the chain ~~is~~ must be not less than 3.

In a case where the ratio L/D is less than 3, the length of the chain is too small, so that the effect of reducing the contact resistance of the anisotropic conductive film without causing short circuit in the plane direction of the film ~~may not be~~ is not obtained by the effect of making

an interaction between the metal powders strong or weak, as described above.

In the mounting of a semiconductor package, considering that the connecting resistance in the thickness direction of the anisotropic conductive film by thermal bonding is made sufficiently low, it is preferable that the chain-shaped metal powder is formed of a complex of a chain formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal, or a complex containing a metal having ~~paramagnetism~~ ferromagnetism and at least one metal, with which a surface of the chain is coated, selected from a group consisting of Cu, Rb, Rh, Pd, Ag, Re, Pt, and Au.

Please amend the specification as follows: Page 24, Line 21 to Page 26, Line 11:

Furthermore, in the mounting of a contact probe, considering that the connecting resistance at the time of connection at a low pressure is further reduced, it is preferable that the chain-shaped metal powder is formed of a complex of a chain formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal, or a complex containing a metal having ~~paramagnetism~~ ferromagnetism and at least one metal, with which a surface of the chain is coated, selected from a group consisting of Cu, Rb, Rh, Pd, Ag, Re, Pt, and Au.

Out of the anisotropic conductive films according to the present invention, one in which the chain-shaped metal powder is oriented in the thickness direction of the film can be produced by:

(1) a method comprising the steps of applying a composite material, having fluidity, containing a chain-shaped metal powder formed of a metal at least a part of which has ~~paramagnetism~~ ferromagnetism and a binding agent on a base to which a magnetic field is applied in a direction crossing a surface of the base, to orient the chain of the metal powder in the composite material in the thickness direction of the film along the direction of the magnetic field, and solidifying or curing the composite material to fix the orientation of the chain, or

(II) a method comprising the steps of spraying a chain-shaped metal powder formed of a metal at least a part of which has ~~paramagnetism~~ ferromagnetism on a base to which a magnetic field is applied in a direction crossing a surface of the base, to orient the chain of the metal powder in the direction of the magnetic field, and applying thereon a coating agent, having fluidity, containing a binding agent, and solidifying or curing the coating agent to fix the orientation of the chain.

Please amend the specification as follows: Page 27, Line 14 to Page 31, Line 24:

It is preferable that as the chain-shaped metal powder, the metal powder or each of the metal particles forming the metal powder is formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal, or a complex containing a metal having ~~paramagnetism~~ ferromagnetism.

Specific examples of the metal powder containing the metal having ~~paramagnetism~~ ferromagnetism include any one of the following types of metal powders (a) to (f) or a mixture of two or more types of metal powders.

(a) A metal powder M1 obtained by linking a lot of metal particles m1 on the order of sub-microns, formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, or an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal, in a chain shape by its own magnetism, as illustrated in partially enlarged fashion in Fig. 1A.

(b) A metal powder M2 obtained by further depositing a metal layer m2 composed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, or an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal on a surface of the metal powder M1 in the foregoing item (a), to tightly bond metal particles to one another, as illustrated in partially enlarged fashion in Fig. 1B.

(c) A metal powder M3 obtained by further depositing a metal layer m3 composed of the other metal such as Ag, Cu, Al, Au, or Rh or an alloy on the surface of the metal powder M1 in the foregoing item (a), to tightly bond metal particles to one another, as illustrated in partially enlarged fashion in Fig. 1C.

(d) A metal powder M4 obtained by further depositing a metal layer m4 composed of the other metal such as Ag, Cu, Al, Au, or Rh or an alloy on a surface of the metal powder M2 in the foregoing item (b), to tightly bond the metal particles to one another, as illustrated in partially enlarged fashion in Fig. 1D.

(e) A metal powder M5 obtained by coating a surface of a granular core material m5a formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, or an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal with a coating layer m5b composed of the other metal such as Ag, Cu, Al, Au, or Rh or an alloy to obtain a complex m5, and linking a lot of complexes m5 in a

chain shape as metal particles by the magnetism of the core material m5a, as illustrated in partially enlarged fashion in Fig. 1E.

(f) A metal powder M6 obtained by further depositing a metal layer m6 composed of the other metal such as Ag, Cu, Al, Au, or Rh or an alloy on a surface of the metal powder M5 in the foregoing item (e), to tightly bond the metal particles to one another, as illustrated in partially enlarged fashion in Fig. 1F.

Although in the drawings, the metal layers m2, m3, m4, and m6 and the coating layer m5 are respectively described as single layers, each of the layers may have a laminated structure of two or more layers composed of the same metal material or different metal materials.

It is preferable that

the whole of the metal powder formed of a metal having ~~paramagnetism~~ ferromagnetism, an alloy of two or more types of metals having ~~paramagnetism~~ ferromagnetism, or an alloy of a metal having ~~paramagnetism~~ ferromagnetism and another metal out of the foregoing metal powders or each of the metal particles , or

a portion, of the metal powder or each of the metal particles formed of a complex containing a metal having ~~paramagnetism~~ ferromagnetism, containing the metal having ~~paramagnetism~~ ferromagnetism,

is formed by being deposited in a solution containing ions forming a metal having ~~paramagnetism~~ ferromagnetism which is its forming material by adding a reducing agent to the solution by the reduction and deposition method.

In the reduction and deposition method, ammonia water or the like is added to a solution in which a trivalent titanium compound such as titanium trichloride serving as a reducing agent and sodium citrate or the like, are dissolved (hereinafter referred to as a "reducing agent

solution") to adjust the pH thereof to 9 to 10. Consequently, trivalent titanium ions are bonded to a citric acid serving as a complexing agent to form a coordination compound, so that activation energy in the case of oxidation from Ti (III) to Ti (IV) is lowered, and a reduction potential is raised. Specifically, a potential difference between Ti (III) and Ti (IV) exceeds 1 V. This value is a significantly higher value, as compared with a reduction potential from Ni (II) to Ni (0) and a reduction potential from Fe (II) to Fe (0). Accordingly, it is possible to efficiently reduce ions forming various types of metals, to deposit and form metal particles, metal films, and so on.

A solution containing ions forming a metal having ~~paramagnetism~~ ferromagnetism such as Ni or a solution containing two or more types of ions forming an alloy containing a metal having ~~paramagnetism~~ ferromagnetism is then added to the above-mentioned reducing agent solution.

Please amend the specification as follows: Page 33, Line 23 to Page 34, Line 25:

Examples of a metal or an alloy having ~~paramagnetism~~ ferromagnetism forming the metal particles, the core materials, or the like include Ni, Fe, Co, and an alloy of two or more types of the metals. Particularly, Ni, a Ni-Fe alloy (Permalloy), and so on are preferable. Particularly metal particles formed of such a metal or alloy are strong in magnetic interaction in a case where they are linked in a chain shape and therefore, are superior in the effect of reducing contact resistance between the metal particles.

Examples of other metals, together with the above-mentioned metal or alloy having ~~paramagnetism~~ ferromagnetism, forming the complexes in the foregoing items (c), (d), (e), and

(f),include at least one type of metal selected from a group consisting of Cu, Rb, Rh, Pd, Ag, Re, Pt, and Au, and its alloy. When consideration is given to improvement in the conductive properties of the metal powder, it is preferable that a portion formed of the metal or metals is a portion exposed to an outer surface of the chain, as described in the foregoing items (c) to (f). A coating can be formed by various types of film forming methods such as an electroless plating method, an electroplating method, a reduction and deposition method, and a vacuum deposition method.

Please amend the specification as follows: Page 36, Line 4 to Page 37, Line 2:

If the particle diameter of metal particles forming the chain is too small, the size of the metal powder itself linked in a chain shape is too small, so that a function as a conductive component cannot be sufficiently obtained. Therefore, it is preferable that the particle diameter of the metal particles is not less than 10 nm.

~~Furthermore, the lower limit of the length of the above-mentioned chain is not particularly limited. However, it is preferable that the length L of the chain is set such that the ratio L/D of the length L to the diameter D of the chain is not less than 3 within a range of the most suitable diameter of the chain, described above.~~

The ratio L/D of the length L to the diameter D of the chain, which defines the lower limit of the length of the chain, must be not less than 3.

If the ratio L/D is less than 3, the shape of the chain comes closer to a granular shape than to a chain shape, so that the effect of lowering the contact resistance of the anisotropic conductive film without causing short circuit in the plane direction of the film ~~may not be~~ is not

obtained by the effect of making the interaction between the metal powders strong or weak, as also previously described.

Please amend the specification as follows: Page 41, Line 7 to Page 42, Line 20:

In the anisotropic conductive film according to the present invention, it is preferable that the chain of the metal powder is fixed in a state where it is oriented in the thickness direction of the film in either of the uses. Such an anisotropic conductive film can be produced by:

(A) applying a composite material, having fluidity, containing a chain-shaped metal powder formed of a metal at least a part of which has ~~paramagnetism~~ ferromagnetism and a binding agent, described above, over a base to which a magnetic field is applied in a direction crossing a surface of the base, to solidify or cure the composite material in a state where the chain of the metal powder is oriented in the thickness direction of the film along the direction of the magnetic field to fix the orientation of the chain of the metal powder, or

(B) spraying a chain-shaped metal powder, described above, on a base to which a magnetic field is applied in a direction crossing a surface of the base, and applying a coating agent, having fluidity, including a binding agent in a state where a chain of the metal powder is oriented in the direction of the magnetic field, to solidify or cure the coating agent to fix the orientation of the chain of the metal powder,

followed by stripping from the base.

It is preferable that the strength of the magnetic field applied in carrying out the methods is not less than 1000 μT, not less than 10000 μT among them, and particularly not less than 40000 μT in terms of a magnetic flux density, considering that the metal powder in the

anisotropic conductive film is sufficiently oriented in the thickness direction of the film, although it differs depending on the type, the ratio, and so on of the metal having ~~paramagnetism~~ ferromagnetism included in the metal powder.

Please amend the specification as follows: Page 61, Line 17 to Page 63, Line 10:

Example 8

Used as a conductive component was an Ni powder, which has the form of a plurality of chains, each having fine Ni particles linked in a straight-chain shape, aggregating in a bundle shape and in which the particle diameter of the Ni particles is 100 nm, ~~and the diameter and the length of the chain are respectively 10 μm and 50 μm~~ the diameter D and the length L of the chain are respectively 10 μm and 50 μm, and the ratio L/D is 5.

The Ni powder and acrylic resin serving as a binding agent were mixed such that the filling factor of the Ni powder would be 1 % by volume, and methyl ethyl ketone was added to a mixture, to prepare a paste-shaped composite material.

The composite material was then applied over a magnet serving as a base, was dried or solidified in a magnetic field with a magnetic flux density of 200000 μT and therefore, was fixed in a state where the metal powder was oriented in the thickness direction of the film, followed by stripping, to produce an anisotropic conductive film having a thickness of 120 μm.

Example 9

An anisotropic conductive film having a thickness of 120 μm was produced in the same manner as that in the example 8 except that an Ni powder, which has the form of fine Ni particles being linked in a straight-chain shape and in which the particle diameter of the Ni particles is 1

μm, ~~and the diameter and the length of the chain are respectively 10 μm and 50 μm~~ the diameter D and the length L of the chain are respectively 10 μm and 50 μm, and the ratio L/D is 5, was used as a conductive component.

Example 10

An anisotropic conductive film having a thickness of 120 μm was produced in the same manner as that in the example 8 except that a metal powder having a composite structure in which a surface of an Ni powder, which has the form of fine Ni particles being linked in a straight-chain shape and in which the particle diameter of the Ni particles is 1 μm, ~~and the diameter and the length of the chain are respectively 10 μm and 50 μm~~ the diameter D and the length L of the chain are respectively 10 μm and 50 μm, and the ratio L/D is 5, is coated with Ag having a thickness of 50 nm, was used as a conductive component.

Example 11

An anisotropic conductive film having a thickness of 120 μm was produced in the same manner as that in the example 8 except that an Ni powder, which has the form of fine Ni particles being linked in a straight-chain shape and in which the particle diameter of the Ni particles is 300 nm, ~~and the diameter and the length of the chain are respectively 600 nm and 50 μm~~ the diameter D and the length L of the chain are respectively 600 nm and 50 μm, and the ratio L/D is 83.3, was used as a conductive component.